terminating in carcinoma. This class of tumors belongs to the so-called "Irritation Group," and the preliminary cell changes have been called precancerous lesions, as already defined. Clinical observation and morphological study have long indicated that the majority of important tumors are not dependent on congenital abnormalities in tissue structure, but arise from once normal but previously altered tissues, and that various forms of chronic inflammation and irritation are observed to precede the appearance of most tumors.

A careful review of the work of Hall, Cabot, Davis, Marion, Marchand, Weir, Berkeley and Bonny, Sweeny and Bloodgood in regard to skin cancer, cancer of the mouth, of the bladder, and vulva should be sufficient to convince the most skeptical in the precancerous lesion as a definite entity and urge us to further effort for evidence of such lesions in the uterus.

The lesions of the cervix uteri which have been most commonly designated or suspected as being precancerous are:

(1) Cervical erosions, (2) lacerations, (3) chronic endocervicitis, (4) chronic hypertrophy, (5) leukoplakia, (6) senile changes, (7) polypi, (8) metaplasia, (9) glandular hypertrophy, (10) submucous fibromata.

The alteration in structure which precedes the definite development of carcinoma of the cervix have been variously interpreted. Schauenstein, Sitzenfrey and Schottlander describe as characteristics of beginning carcinoma the following changes:

1. The appearance of groups of irregular hypertrophied epithelial cells with hyperchromatic nuclei, with irregularity and indistinctness of cell borders.

2. Loss of regular stratification of cell layers, especially of the proliferating basal cells (Schottlander). He also emphasizes the importance of marked nuclear granulations.

The significance of these changes is contested. Huerlin and Pick interpret them as atypical hypertrophy and regeneration. Yet if to the above criteria are added:

3. Downward growth of epithelial papillae and definite heteropia, there is little doubt that one has to deal with the early stages of carcinoma. Bloodgood emphasizes the breaking through of the basal layer of cells and lymphoid reaction about the papillae. Rubin pictures extremely early but quite definite proliferation of atypical cylindrical and squamous cells on the surface and in the glands of old erosions, and the routine study of such erosions reveals many phases of such precancerous lesions. It need not be assumed that every case presenting the above changes will necessarily develop cancer, focal epidermization often remaining stationary; but it is highly important to recognize that the majority of cervical cancers develop from such altered cells. When atypical hyperchromatic and hypertrophied cells are growing downward from the epidermis or fill enlarged gland alveoli, the diagnosis of beginning carcinoma is justified.

Ewing lists as histological criteria in the diagnosis of cancer the following:

1. Cellular overgrowth passing beyond that observed in other processes affecting the same tissues.
2. Atypical qualities of the cells, metaplasia, anaplasia.
3. Loss of polarity.
4. Heteropia.
5. Desoplastic properties.
6. Local invasive properties.
7. Metastases.

Many interesting specimens of early epithelial proliferations have been found in the routine microscopic examinations of all tissues removed at operations in the Gynecologic Clinic of the University of California Medical School. These range from simple epithelial proliferation, possibly as a result of inflammatory changes, to microscopic areas which show mitotic figures and invasion of the basement membrane and adjacent structures by new-formed cells.

## THE VALUE OF BASAL METABOLISM ESTIMATIONS IN CASES WITH LOWERED METABOLISM *

By R. B. HILL, M. D., Los Angeles.

We are learning more and more that the ductless glands of the body control many of its functions by their specific activities. The physical and mental development of the individual are dependent on their action and interaction. Nutrition of the body, of the mind and of the sex organs is dependent on the trophic stimuli of the endocrine system. These glands are concerned with the body growth long before their trophic relation is evidenced by the development of the secondary sex characteristics.

It has been known for years that the secretions of the ductless glands have been intimately related to the metabolism of the body. However, it has been only within the past few years that they have received the study that their importance justifies. Such interest has been aroused chiefly through the clinical application of the results of purely scientific studies and the devising of methods of study which could be used by the clinician. The determination of the basal metabolic rate has become a necessary factor in diagnostic medicine, and the value of this procedure in aiding in the determination of the activity of the endocrines is rapidly becoming recognized.

While the action of all of the internal secretions upon metabolism is not entirely clear, it has been definitely established that one controlling factor in the regulation of basal metabolism is thyroxin, on which the functional activity of the thyroid gland is largely, if not altogether, dependent. So characteristic of thyroid diseases are changes in basal metabolism that its determination is accepted as an index to the activity of that gland, provided, of course, that other diseases which bear upon metabolism are excluded.

While the determination of the basal metabolic

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rate furnishes reliable proof for or against the under or over-activity of the thyroid gland, and it is not necessary to depend entirely upon the hormonic signs and symptoms, the physical characteristics do play a most important role in the diagnosis.

The thyroid has been called the "gland of energy." "It speeds up and activates all the functions and organs." The patient suffering from hypothyroidism lacks energy, is dull, has a tendency to melancholia and has a poor memory. There are changes in the skin and hair, the patient looks old; there is enlargement of the abdomen and a tendency to become stout. Mucoid edema of the subcutaneous tissues and an atheromatous change in the aorta are sometimes found. There is a diminution in perspiration, a moderate degree of anemia and the genital functions are diminished; digestion is altered. Thyroid inhibits the islets of the pancreas, therefore in cases of decreased thyroid activity the power to assimilate carbohydrates is increased.

Peristalsis and intestinal secretion are influenced to a certain extent by thyroid secretion, so that many digestive annoyances are associated with thyroid affections. An altered relation in the secretion of the thyroid and pituitary may, owing to their relation to the pancreas and liver, markedly influence the sugar tolerance and bear a close connection to diabetes.

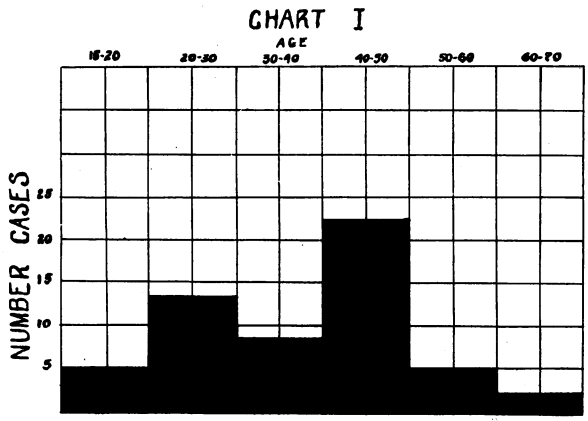
The thyroid, aside from its many stimulating and protective functions, is distinctly a sex gland. During the period of menopause there is a normal waning of ovarian function, with which there should be a gradual diminution of thyroid activity. Since every ductless gland is affected by the underactivity or the overactivity of any of the other glands, the instability of gland function, so particularly marked in the female, can readily be accounted for. This is shown from the fact that diseases of the thyroid are from six to ten times more frequent in women than in men. The entire co-ordination between the glands is often upset at the menopause, hence at this time we frequently see nervous disturbances in the female.

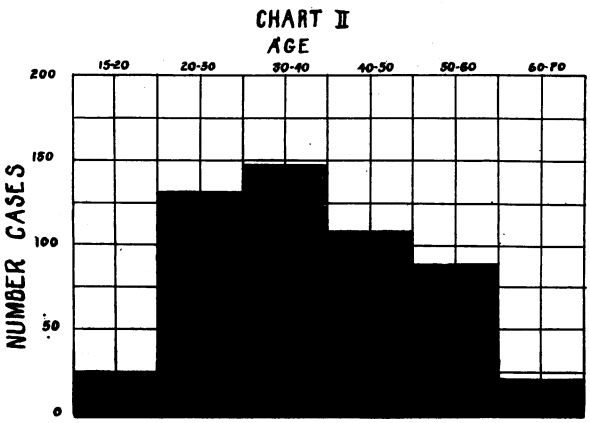
When the nervous and digestive symptoms of thyroid disorders, the associated mental upsets, the metabolic changes and physical and mental lack of tone and energy are considered, it is evident that in this type and numerous milder forms there may be included many cases suffering from hypothyroidism which in the past were diagnosed as hysteria or neurasthenia.

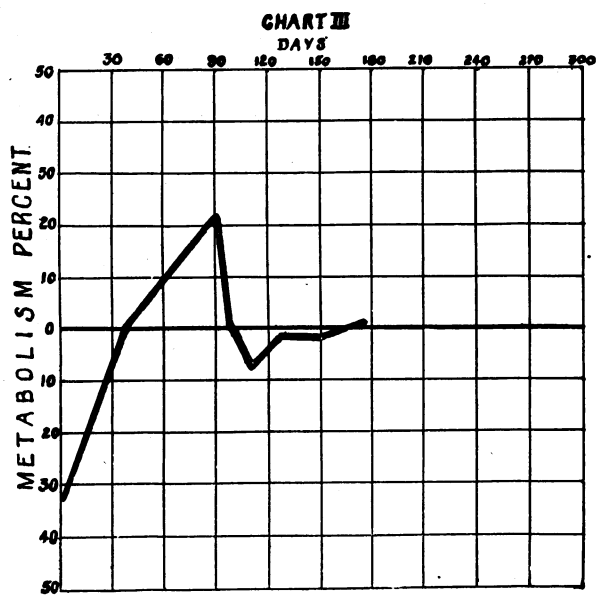
An analysis of the outstanding signs and symptoms, together with basal metabolic readings of a series of 54 cases, in which the basal metabolism readings were low, is presented. In many of the cases a diagnosis was definitely established and in others clinical diagnoses confirmed by an estimation of the oxygen consumption.

Of these 54 cases, 48 were females and 6 males. Five were between the ages of 15-20, thirteen between 20-30, seven between 30-40, twenty-two between 40-50, five between 50-60, and two between 60-70.

Chart I illustrates graphically the ages in




which such derangements are most common. It will be seen that the greatest number occurred between the ages of 40-50, or the menopause age, and the next largest number between the ages of 20-30, or the period when glandular stability is being established.

As these cases all occurred in a large general office practice, it was thought that the disproportion of the cases between the ages of 40-50 might be accounted for by the fact that the greatest

number of all patients registering were between those ages.

Chart II, prepared from a survey of the ages of 540 consecutive cases, shows that the peak is reached between the ages of 30-40.

The estimations were made with a Benedict respiration apparatus and the arbitrary figure of minus 10 taken as the lower limit of normal. It has seemed to me that the wide range ordinarily accepted for the normal reading is too great when the estimations are well controlled, as most of our normal readings do not vary more than 5 per cent.

The readings in the 54 cases varied between minus 13 and minus 47, the average being minus 20.2 before treatment was instituted; the average reading following the adminstration of thyroid extract, thyroid extract and ovarian extract, and, in some, ovarian extract alone was minus 4.4.

The chief complaints of forty-eight of the patients were nervousness, exhaustion and no ambition, indefinite symptoms which might be due to a variety of causes, the most common probably being syphilis and tuberculosis. There was no evidence of tuberculosis or syphilis in any of the cases physically. The radiological and serological examinations were negative. The typical appearance of the advanced myxedema patient was not present in any of the cases. Fourteen complained of a rapid heart, and fifteen of a rapid gain in weight. The thyroid gland was definitely enlarged in fourteen; three of these complained of palpitation. The pulse was slow in forty. The average systolic blood pressure was 125; the average diastolic pressure 74.

Following the administration of glandular therapy twelve of the cases were apparently well, thirty-eight improved and four unimproved. Of the four unimproved, three were epileptics and one a case of paralysis agitans. The average time necessary to bring the metabolism readings to normal was three weeks. Undoubtedly, many classed as improved will eventually be entirely well, as it is sometimes difficult to establish the dosage of the glandular extracts necessary for a particular patient. To accomplish this, it is necessary to follow the clinical course closely and make frequent basal metabolism readings.

Chart III shows the basal metabolic curve of a patient who was given thyroid extract and did not report for observation again for seven weeks, when there were marked symptoms of hyperthyroidism and the basal metabolism reading was plus 23.

The study of the present group of cases has impressed me with the relative frequency of the condition and the marked improvement that can be attained by the administration of some of the glandular extracts in selected cases. While it would seem to be unwise to become too enthusiastic over what seem to be satisfactory results in complaints of this kind until the cases have been observed over a long period of time, the results are presented for what interest they may have.

## RESTORATION OF FUNCTION IN ACQUIRED HAND DEFORMITIES *

By A. GOTTLIEB, M. D., and L. I. NEWMAN, M. D., San Francisco, Cal.

From the latest report of the Industrial Accident Commission of California [1] we have extracted figures to demonstrate the "total" number of industrial accidents in the state and the average disability in days; the number of cases of all permanently disabled and their average disability in days for which compensation had to be paid to the employes: and we have compiled figures from the same source to show the frequency of "hand" injuries and deformities and the resulting losses in time, function and compensation payments. Comparing the figures for the "total" with those for the "hand," we learn that hand injuries, not counting the hand deformities which are secondary to arm and forearm lesions, form 30.3 per cent of the total number of industrial accidents, and that the average loss of working days is 2.8 times greater for the hand than for all injuries combined. The reason for this state of affairs is to be sought in the fact that the hand is the most needed tool for the performance of work and that, notwithstanding accident prevention measures, it frequently gets caught in the working machine; further that no workman can return to his occupation unless the wound has healed and at least minimum function has returned, which accounts for the large number of lost working days.

From the figures of the report given under the heading "loss of function" it has been calculated that in a number of cases the hand represents 65.3 per cent of the "total." This high percentage of hand cases with loss of function can only be accounted for by the neglect of early preventive physiotherapy in the acute stage of the injury because of the wrong conception deeply rooted in the medical profession that functional restoration is the object of aftertreatment with physical remedies and can be entrusted to the masseur or the reconstruction aid.

The comparative low figures in days, i. e. 214.2 for the "hand" against 352.1 for the "total" (chart 1) during which temporary compensation has been paid, is explained by the multiple cases, 783, of low percentage, 1-10, of impairment (chart 2). Under this column are classed the cases which have resulted from the minutest injuries, cuts and bruises, to the more severe which, however, return to work within not over forty weeks.

The economic loss sustained by industry through hand injuries is enormous but uncertain of calculation, because it involves so large a number of workmen of various vocations which are thrown out of work for a considerable length of time during which they are not sick enough to be hospitalized and not well enough to be useful. This type of injured are not only forced to idleness but are exposed to moral degradation and frequently to compensation neurosis as well.

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